



# **STIC Search Report**

## **EIC 2100**

**STIC Database Tracking Number: 171332**

**TO: Kuen S Lu**  
**Location: RND 3B02**  
**Art Unit: 2167**  
**Monday, November 14, 2005**

**Case Serial Number: 09/965393**

**From: Ruth E. Spink**  
**Location: EIC 2100**  
**RND-4B31**  
**Phone: 23524**

**Ruth.spink@uspto.gov**

### **Search Notes**

Kuen – Attached is the foreign patent and NPL search for the above referenced case. I tagged a few that I thought might be of particular interest. Be sure to let me know if you would like for me to refocus the search.

Ruth



# STIC EIC 2100 Search Request Form

171332

Today's Date:

11/14/2005

What date would you like to use to limit the search?

Priority Date:

9/27/2004

Other:

Name

Kuen S. Lu

AU

2167

Examiner #

79991

Room #

RAN 3B02

Phone

571-272-4114

Serial #

09 1965, 393

Format for Search Results (Circle One):

☒ PAPER

☐ DISK

☐ EMAIL

Where have you searched so far?

☒ USP

☐ DWPI

☒ EPO

☒ JPO

☒ ACM

☐ IBM TDB

Citeset

☐ IEEE

☐ INSPEC

☐ SPI

Other

Google, Oracle

Is this a "Fast & Focused" Search Request? (Circle One) ☒ YES ☐ NO

A "Fast & Focused" Search is completed in 2-3 hours (maximum). The search must be on a very specific topic and meet certain criteria. The criteria are posted in EIC2100 and on the EIC2100 NPL Web Page at <http://ptoweb/patents/stic/stic-tc2100.htm>.

Please complete by 12:30 PM 11/14/05  
THANKS

What is the topic, novelty, motivation, utility, or other specific details defining the desired focus of this search? Please include the concepts, synonyms, keywords, acronyms, definitions, strategies, and anything else that helps to describe the topic. Please attach a copy of the abstract, background, brief summary, pertinent claims and any citations of relevant art you have found.

the very concept:

3 writes US  
2 writes

1. (Currently Amended) A method for writing file systems write data operations to a storage medium comprising the steps of:  
  
storing a file systems write data operation in a first temporary data store;  
  
mirroring the file systems write data operation in a second temporary data store; and  
  
deleting the mirrored file systems write data operation from the second temporary data store in the case when upon receiving of a signal indicating that the file systems write data operation is successfully written from the first temporary data store to the storage medium.

STIC Searcher

Phone

Date picked up

Date Completed



*Patent bid*

Set	Items	Description
S1	3687459	STORE? ? OR STORAGE OR DRIVE? ? OR DISK? ? OR DISC? ?
S2	153518	(TEMPORARY OR SECONDARY OR BACKUP OR BACK?())UP OR STORE OR STORAGE)() (DEVICE? ? OR APPARATUS? ? OR SYSTEM? ? OR SUBSYSTEM? ? OR UNIT? ? OR DRIVE? ? OR DISK? ? OR DISC? ?)
S3	944622	THREE OR THIRD OR 3RD OR TERTIARY
S4	6550	(SECONDARY OR SECOND OR 2ND OR ALTERNATIVE OR ANOTHER OR ADDITIONAL) (3N) S2
S5	3712	(PLURAL? OR MORE()THAN()ONE OR MANY OR SEVERAL OR MULTIPLE? ? OR MULTIPLICITY OR NUMEROUS) (3N) S2
S6	214889	MIRROR?
S7	2404	(DELETE? ? OR DELETING OR ERASE? ? OR ERASING OR REMOVE? ? OR REMOVING) (5N) (S6 OR COPY OR COPIES)
S8	6722	(SUCCESS? OR COMPLETE OR COMPLETED OR (ERROR? ? OR CORRUPT-?) (2N) (FREE OR NO OR "NOT")) (5N) (S6 OR COPY OR COPIES OR COPYING OR WRITE OR WRITING OR WRITTEN)
S9	0	(S4 OR S5) AND S6 AND S7 AND S8
S10	114	(S4 OR S5) AND S6
S11	81	S10 AND IC=G06F
S12	2	S10 AND IC=G06F-007
S13	1	(S4 OR S5) AND S6 AND (S7 OR S8)
S14	7897	S3 (3N) (STORE? ? OR STORAGE)
S15	0	S14 AND S6 AND S7 AND S8
S16	0	S14 AND S6 AND (S7 OR S8)
S17	50	S14 AND S6
S18	14	S17 AND IC=G06F
S19	14	IDPAT (sorted in duplicate/non-duplicate order)
S20	14	IDPAT (primary/non-duplicate records only)

File 347:JAPIO Nov 1976-2005/Jul(Updated 051102)  
(c) 2005 JPO & JAPIO

File 350:Derwent WPIX 1963-2005/UD,UM &UP=200572  
(c) 2005 Thomson Derwent

12/5/1 (Item 1 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
(c) 2005 Thomson Derwent. All rts. reserv.

012064466 \*\*Image available\*\*  
WPI Acc No: 1998-481377/199841  
XRPX Acc No: N98-375514

**Method converting memory stored on several data storage devices to 2nd memory structure for RAID storage management - divides storage space in array into sets of blocks which are formatted independently as based on different memory structures which are non-redundant, mirrored and**

**parity protected, RAID 4 or 5**

Patent Assignee: IBM CORP (IBMC ); INT BUSINESS MACHINES CORP (IBMC )

Inventor: STYCZINSKI D A

Number of Countries: 006 Number of Patents: 008

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 9838568	A1	19980903	WO 97US8985	A	19970528	199841 B
US 5960169	A	19990928	US 97805652	A	19970227	199947
CN 1247608	A	20000315	CN 97181961	A	19970528	200031
JP 2000511318	W	20000829	WO 97US8985	A	19970528	200045
			JP 98537604	A	19970528	
KR 2000070207	A	20001125	WO 97US8985	A	19970528	200131
			KR 99706433	A	19990715	
TW 436689	A	20010528	TW 98101865	A	19980211	200172
JP 3266277	B2	20020318	WO 97US8985	A	19970528	200222
			JP 98537604	A	19970528	
KR 321843	B	20020202	WO 97US8985	A	19970528	200255
			KR 99706433	A	19990715	

Priority Applications (No Type Date): US 97805652 A 19970227

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
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WO 9838568	A1	E	59	G06F-007/22	
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Designated States (National): CN JP KR SG

US 5960169	A			G06F-011/00	
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CN 1247608	A			G06F-007/22	
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JP 2000511318	W	69		G06F-003/06	Based on patent WO 9838568
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KR 2000070207	A			G06F-007/22	Based on patent WO 9838568
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TW 436689	A			G06F-012/00	
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JP 3266277	B2	25		G06F-003/06	Previous Publ. patent JP 200011318
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Based on patent WO 9838568

KR 321843	B			G06F-007/22	Previous Publ. patent KR 2000070207
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Based on patent WO 9838568

Abstract (Basic): WO 9838568 A

The method identifies a set of blocks (903, 905, 907, 909, 911 and 913) of data to be converted. Each block of the set is stored on a different one of the **several data storage devices**. The set has **several** pairs of blocks, with both blocks of each pair containing identical data.

A first block of the set is selected and designated as a parity block. A block is selected from each pair of blocks of the set which does not include the first block. Each block selected from each pair of blocks of the set which does include the first block is designated as available for storage of replacement data.

USE - Relates to digital storage systems and to management of redundant array of independent storage devices, referred to as RAID.

ADVANTAGE - Provides more flexible storage subsystem for computer system, and enhances ability of storage subsystem of computer system to be reconfigured to meet needs of user of computer system

Title Terms: METHOD; CONVERT; MEMORY; STORAGE; DATA; STORAGE; DEVICE; MEMORY; STRUCTURE; RAID; STORAGE; MANAGEMENT; DIVIDE; STORAGE; SPACE;

12/5/2 (Item 2 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
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008777629 \*\*Image available\*\*  
WPI Acc No: 1991-281646/199138  
Related WPI Acc No: 1991-281651; 1991-325398; 1991-353965  
XRPX Acc No: N91-215268

**Two level redundant disc drive controller system - switches routing  
between controlled to maintain operation in event of malfunction in one  
controller**

Patent Assignee: MICRO TECHNOLOGY INC (MICR-N); EMC CORP (EMCE-N); SF2 CORP  
(SFTW-N); MICRO TECHNOLOGY CORP (MICR-N)

Inventor: GAJJAR K; GLIDER J S; HENSON L P; IDLEMAN T E; JAFFE D H; KOONTZ  
R S; POWERS D T; GLIDER J; HENSON L; KOONITZ R; JOHNSON H S

Number of Countries: 033 Number of Patents: 018

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 9113399	A	19910905				199138 B
AU 9174770	A	19910918				199150
AU 9175846	A	19910918				199150
AU 9176718	A	19911030				199205
AU 9176886	A	19911127				199210
US 5134619	A	19920728	US 90505622	A	19900406	199233
US 5140592	A	19920818	US 90488749	A	19900302	199236
			US 90505622	A	19900406	
			US 90506703	A	19900406	
			US 90601482	A	19901022	
US 5166939	A	19921124	US 90488749	A	19900302	199250
EP 517857	A1	19921216	EP 91907076	A	19910228	199251
			WO 91US1276	A	19910228	
US 5212785	A	19930518	US 90506703	A	19900406	199321
US 5274645	A	19931228	US 90488749	A	19900302	199401
			US 90505622	A	19900406	
			US 90506703	A	19900406	
			US 90601482	A	19901022	
			US 92872560	A	19920423	
JP 6500186	W	19940106	JP 91506558	A	19910228	199406
			WO 91US1276	A	19910228	
US 5285451	A	19940208	US 90505622	A	19900406	199407
			US 92914662	A	19920715	
EP 517857	A4	19950607	EP 91907076	A	19910000	199616
US 5651110	A	19970722	US 90506703	A	19900406	199735
			US 9318983	A	19930218	
			US 95422005	A	19950412	
EP 517857	B1	19981223	EP 91907076	A	19910228	199904
			WO 91US1276	A	19910228	
DE 69130669	E	19990204	DE 630669	A	19910228	199911
			EP 91907076	A	19910228	
			WO 91US1276	A	19910228	
CA 2081365	C	19990622	CA 2081365	A	19910228	199944
			WO 91US1276	A	19910228	

Priority Applications (No Type Date): US 90601482 A 19901022; US 90488749 A  
19900302; US 90505622 A 19900406; US 90506703 A 19900406; US 92872560 A  
19920423; US 92914662 A 19920715; US 9318983 A 19930218; US 95422005 A  
19950412

Cited Patents: Jnl.Ref; US 4467421; US 4722085; US 4825403; US 4849929; US  
4899342; US 4914656; EP 369707; US 4697232; US 4761785

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9113399	A		111		

Designated States (National): AT AU BB BG BR CA CH DE DK ES FI GB HU JP  
KP KR LK LU MC MG MW NL NO RO SD SE SU

Designated States (Regional): AT BE CH DE DK ES FR GB GR IT LU NL OA SE

US 5134619	A	24	G06F-011/10	
US 5140592	A	56	G06F-011/20	CIP of application US 90488749
				CIP of application US 90505622
				CIP of application US 90506703
US 5166939	A	18	G06F-007/22	
EP 517857	A1 E	111	G06F-007/22	Based on patent WO 9113399
Designated States (Regional): DE FR GB IT				
US 5212785	A	17	G06F-013/12	
US 5274645	A	54	G06F-011/20	CIP of application US 90488749
				CIP of application US 90505622
				CIP of application US 90506703
				Cont of application US 90601482
JP 6500186	W	111	G06F-003/06	Based on patent WO 9113399
US 5285451	A	22	G06F-011/10	Cont of application US 90505622
				Cont of patent US 5134619
US 5651110	A	18	G06F-013/14	Cont of application US 90506703
				Cont of application US 9318983
				Cont of patent US 5212785
EP 517857	B1 E		G06F-007/22	Based on patent WO 9113399
Designated States (Regional): DE FR GB IT				
DE 69130669	E		G06F-007/22	Based on patent EP 517857
				Based on patent WO 9113399
CA 2081365	C E		G06F-011/10	Based on patent WO 9113399

Abstract (Basic): WO 9113399 A

The system has controllers to control the data flow to and from the external source. Memory devices are divided into groups where each group is controlled by at least two controllers to provide redundancy back-up. Data handlers are coupled to controllers for disassembling data into data blocks to be written across a group of memory devices.

Error detectors receive data from the controller calculate at least one error detection term for each group and transmit the error detection term to an error code storage device in the memory groups.

USE/ADVANTAGE - In interfacing computer to external storage devices. High bandwidth. High operation rate. High reliability. (111pp Dwg.No.3/25)

Title Terms: TWO; LEVEL; REDUNDANT; DISC; DRIVE; CONTROL; SYSTEM; SWITCH; ROUTE; CONTROL; MAINTAIN; OPERATE; EVENT; MALFUNCTION; ONE; CONTROL

Derwent Class: T01

International Patent Class (Main): G06F-003/06; **G06F-007/22** ; G06F-011/10; G06F-011/20; G06F-013/12; G06F-013/14

International Patent Class (Additional): G11B-020/18; H03M-013/00

File Segment: EPI

13/5/1 (Item 1 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
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015250668 \*\*Image available\*\*

WPI Acc No: 2003-311594/200330

Related WPI Acc No: 1993-152025; 1993-404302; 1994-248718; 1994-358517;  
1998-260868; 1999-243439; 2000-328326; 2001-326639; 2003-327764;  
2003-830438; 2004-355455

XRPX Acc No: N03-248052

**Remote data mirroring system for computer based database management system, transfers data from primary storage system to secondary storage system while storing data in primary system based on service information**

Patent Assignee: ALTERESCU B (ALTE-I); CASTEL D (CAST-I); SHKLARSKY G G (SHKL-I); VISHLITZKY N (VISH-I); YANAI M (YANA-I); EMC CORP (EMCE-N)

Inventor: ALTERESCU B; CASTEL D; SHKLARSKY G G; VISHLITZKY N; YANAI M; CASTEL D D C

Number of Countries: 001 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20020194442	A1	20021219	US 9352039	A	19930423	200330 B
			US 96654511	A	19960528	
			US 9861708	A	19980417	
			US 2000709814	A	20001110	
			US 2002224211	A	20020820	
US 6625705	B2	20030923	US 9352039	A	19930423	200364
			US 96654511	A	19960528	
			US 9861708	A	19980417	
			US 2000709814	A	20001110	
			US 2002224211	A	20020820	

Priority Applications (No Type Date): US 96654511 A 19960528; US 9352039 A 19930423; US 9861708 A 19980417; US 2000709814 A 20001110; US 2002224211 A 20020820

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 20020194442	A1	12	G06F-012/16	CIP of application US 9352039 Cont of application US 96654511 Div ex application US 9861708 Div ex application US 2000709814 CIP of patent US 5544347 Cont of patent US 5742792 Div ex patent US 6173377
US 6625705	B2		G06F-012/16	CIP of application US 9352039 Cont of application US 96654511 Div ex application US 9861708 Div ex application US 2000709814 CIP of patent US 5544347 Cont of patent US 5742792 Div ex patent US 6173377

Abstract (Basic): US 20020194442 A1

NOVELTY - The primary storage system (14) starts writing data by initially storing data on a cache memory (28) in response to command from a host computer (12). The data is transferred to data storage devices (20,48) of primary and **secondary storage systems** (14,46) based on the service information communicated between controllers (16,44) of the storage systems through processors (34,62).

USE - For managing databases related to banks, insurance companies, stock markets, etc., from natural and artificial disasters.

ADVANTAGE - Ensures **complete copying** of notified data without any errors due to autonomous host independent control of remote storage system.

DESCRIPTION OF DRAWING(S) - The figure shows a block diagram of remote data **mirroring** system.

Host computer (12)  
Storage systems (14,46)  
Controllers (16,44)  
Data storage devices (20,48)  
Cache memory (28)  
Processors (34,62)  
pp; 12 DwgNo 1/4

Title Terms: REMOTE; DATA; **MIRROR** ; SYSTEM; COMPUTER; BASED; DATABASE;  
MANAGEMENT; SYSTEM; TRANSFER; DATA; PRIMARY; STORAGE; SYSTEM; SECONDARY;  
STORAGE; SYSTEM; STORAGE; DATA; PRIMARY; SYSTEM; BASED; SERVICE;

INFORMATION

Derwent Class: T01  
International Patent Class (Main): G06F-012/16  
International Patent Class (Additional): H02H-003/05  
File Segment: EPI



20/5/1 (Item 1 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
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Wrong  
date

017313800 \*\*Image available\*\*  
WPI Acc No: 2005-637433/200565  
XRPX Acc No: N05-522694

**Daisy-chained device- mirroring architecture, has two nodes that is operable under normal circumstances to forward writes received to one of nodes and third node via respective main links**

Patent Assignee: COCHRAN R A (COCH-I); DUVEKOT M (DUVE-I)

Inventor: COCHRAN R A; DUVEKOT M

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20050193179	A1	20050901	US 2004787161	A	20040227	200565 B

Priority Applications (No Type Date): US 2004787161 A 20040227

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 20050193179	A1	20	G06F-012/16	

Abstract (Basic): US 20050193179 A1

NOVELTY - The architecture has primary storage node (90) configured to **mirror** data on an entity representing secondary **storage** node (100). A **tertiary storage** node (110) is coupled via a main link to the node (90). A quaternary storage node (120) is coupled via another link to the node (110). Each node (90,110) is operable under normal circumstances to forward writes received to the nodes (110,120) via the respective links.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of operating a daisy-chained device- **mirroring** architecture that includes a storage node.

USE - Daisy-chained device- **mirroring** architecture.

ADVANTAGE - The architecture tolerates a single point of failure (SPOF) in exchange for slightly increased downstream storage node responsibility.

DESCRIPTION OF DRAWING(S) - The drawing shows a multi-site hierarchical pseudo- cascaded synchronous and asynchronous **mirroring** variety of data storage architecture.

Primary storage node (90)

Secondary storage node (100)

**Tertiary storage** node (110)

Quaternary storage node (120)

Standby storage node shunting link (130)

pp; 20 DwgNo 2/6

Title Terms: DAISY; CHAIN; DEVICE; **MIRROR** ; ARCHITECTURE; TWO; NODE; OPERATE; NORMAL; CIRCUMSTANCE; FORWARD; WRITING; RECEIVE; ONE; NODE; THIRD; NODE; RESPECTIVE; MAIN; LINK

Derwent Class: T01

International Patent Class (Main): **G06F-012/16**

File Segment: EPI

20/5/2 (Item 2 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
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Wrongdt

016764936 \*\*Image available\*\*  
WPI Acc No: 2005-089212/200510  
XRPX Acc No: N05-077918

**Data managing method for use in network computing environment, involves copying updates from one storage system to another storage system that is in remote location, after reconfiguring network resources**

Patent Assignee: KERN R F (KERN-I); LUDVIG R W (LUDV-I); PETERSEN D B (PETE-I); IBM UK LTD (IBMC ); INT BUSINESS MACHINES CORP (IBMC )

Inventor: KERN R F; LUDVIG R W; PETERSEN D B; PETERSEN D

Number of Countries: 108 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20040260899	A1	20041223	US 2003465726	A	20030618	200510 B
WO 200571544	A1	20050804	WO 2004EP51117	A	20040615	200551

Priority Applications (No Type Date): US 2003465726 A 20030618

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
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US 20040260899	A1	20	G06F-012/16	
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WO 200571544	A1 E		G06F-011/20	
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Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ  
CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID  
IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ  
NA NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ  
UA UG US UZ VC VN YU ZA ZM ZW

Designated States (Regional): AT BE BG BW CH CY CZ DE DK EA EE ES FI FR  
GB GH GM GR HU IE IT KE LS LU MC MW MZ NA NL OA PL PT RO SD SE SI SK SL  
SZ TR TZ UG ZM ZW

Abstract (Basic): US 20040260899 A1

NOVELTY - The method involves reconfiguring network resources to direct input/output requests from volumes in one storage system to volumes in another storage system in response to detecting a failure of the former storage system and the availability of the latter storage system. Updates to the latter storage system are copied to **third storage** system in remote location after reconfiguring the network resources.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(A) a system for managing data

(B) an article of manufacture for managing data, wherein the article of manufacture includes one program to cause operations to be performed with respect to storage systems having volumes.

USE - Used for managing data in a network computing environment.

ADVANTAGE - The method allows failover to remote sites and at the same time maintains continuous availability of data with minimal interruption.

DESCRIPTION OF DRAWING(S) - The drawing shows operations performed to **mirror** data to different storage locations.

pp; 20 DwgNo 3/11

Title Terms: DATA; MANAGE; METHOD; NETWORK; COMPUTATION; ENVIRONMENT; COPY; UPDATE; ONE; STORAGE; SYSTEM; STORAGE; SYSTEM; REMOTE; LOCATE; AFTER; NETWORK; RESOURCE

Derwent Class: T01; W01; W05

International Patent Class (Main): G06F-011/20 ; G06F-012/16

File Segment: EPI

20/5/3 (Item 3 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
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*Wray  
date*

016764914 \*\*Image available\*\*  
WPI Acc No: 2005-089190/200510  
XRPX Acc No: N05-077896

**Data mirroring method for use in network computing environment,  
involves copying updated volumes in storage system to volumes in third  
storage system during suspension of copying of volumes between former  
system and another system**

Patent Assignee: KERN R F (KERN-I); MICKA W F (MICK-I); PETERSEN D B  
(PETE-I); SPEAR G A (SPEA-I)

Inventor: KERN R F; MICKA W F; PETERSEN D B; SPEAR G A

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20040260736	A1	20041223	US 2003465111	A	20030618	200510 B

Priority Applications (No Type Date): US 2003465111 A 20030618

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 20040260736	A1	19	G06F-017/30	

Abstract (Basic): US 20040260736 A1

NOVELTY - The method involves transmitting a command for copying updates to volumes in a storage system to corresponding volumes in another storage system indicated in a **mirror** policy (36). The copying of volumes between the storage systems is suspended if an event occurs. Updated volumes in the latter storage system are copied to the volumes in a **third storage** system during suspension of copying of volumes between the systems.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(A) a system for **mirroring** data

(B) an article of manufacture for **mirroring** data among storage systems.

USE - Used for **mirroring** data in a network computing environment.

ADVANTAGE - The method **mirrors** data between distant sites to allow recovery of data in case of a failure at an entire site, thus minimizing disruptions to data availability.

DESCRIPTION OF DRAWING(S) - The drawing shows a block diagram illustrating a network computing environment.

Remote site (20)

Monitoring system (32)

Monitoring program (34)

**Mirror** policy (36)

pp; 19 DwgNo 1/11

Title Terms: DATA; **MIRROR**; METHOD; NETWORK; COMPUTATION; ENVIRONMENT;  
COPY; UPDATE; VOLUME; STORAGE; SYSTEM; VOLUME; THIRD; STORAGE; SYSTEM;  
SUSPENSION; COPY; VOLUME; FORMER; SYSTEM; SYSTEM

Derwent Class: T01; W01

International Patent Class (Main): **G06F-017/30**

File Segment: EPI

20/5/4 (Item 4 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
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*Wrong  
date*

015855319 \*\*Image available\*\*  
WPI Acc No: 2004-013149/200402  
XRPX Acc No: N04-009718

**Data backup method for a mobile or desktop PC in which data, including system data, is stored to a backup device so that in the event of system failure data and system environment can be restored to a replacement computer**

Patent Assignee: FUJITSU SIEMENS COMPUTERS GMBH (SIEI )  
Inventor: FISCHER R; OBERREINER A  
Number of Countries: 031 Number of Patents: 004  
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
DE 10219344	A1	20031120	DE 10219344	A	20020430	200402 B
EP 1365324	A2	20031126	EP 20033784	A	20030219	200402
EP 1365324	B1	20050824	EP 20033784	A	20030219	200556
DE 50301029	G	20050929	DE 301029	A	20030219	200564
			EP 20033784	A	20030219	

Priority Applications (No Type Date): DE 10219344 A 20020430

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
DE 10219344	A1		5	G06F-012/16	
EP 1365324	A2	G		G06F-011/14	
Designated States (Regional): AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR					
EP 1365324	B1	G		G06F-011/14	
Designated States (Regional): AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT SE SI SK TR					
DE 50301029	G			G06F-011/14	Based on patent EP 1365324

Abstract (Basic): DE 10219344 A1

NOVELTY - Data backing-up, exchange and removal method for mobile and desktop PCs in which data stored on a first PC with a first operating system and environment is transferred to a second suitable data medium for backup purposes. The data backup includes system specific information, so that if an accident occurs to the first PC the second data medium can be connected to a second PC so that data including system data can be transferred to its ( **third** ) data **storage** unit. The system information and other data can be used to create a second computing environment that largely **mirrors** the first.

USE - Data backup method for a mobile or desktop PC.

ADVANTAGE - The inventive method ensures that in the event of failure of a user PC a replacement PC can be quickly configured so that it has the same operating environment, without the need for redundant components, etc.

DESCRIPTION OF DRAWING(S) - The figure shows two computers and other components essential for inventive method implementation.

first and second computer systems (1, 2)

data media (1.1, 1.2)

backup component (1.3)

third data medium device. (2.1)

pp; 5 DwgNo 1/1

Title Terms: DATA; METHOD; MOBILE; DATA; SYSTEM; DATA; STORAGE; DEVICE; SO; EVENT; SYSTEM; FAIL; DATA; SYSTEM; ENVIRONMENT; CAN; RESTORATION; REPLACE ; COMPUTER

Derwent Class: T01

International Patent Class (Main): G06F-011/14 ; G06F-012/16

File Segment: EPI

20/5/6 (Item 6 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
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013065236 \*\*Image available\*\*  
WPI Acc No: 2000-237108/200020  
Related WPI Acc No: 1997-480410  
XRPX Acc No: N00-177831

**Data backup copy generating method in tertiary storage device,  
involves resuming mirroring after performing backup of data stored in  
one set of volumes to tertiary storage device**

Patent Assignee: EMC CORP (EMCE-N)

Inventor: RAZ Y; TAMER P

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 6035412	A	20000307	US 96617689	A	19960319	200020 B
			US 97820912	A	19970319	

Priority Applications (No Type Date): US 97820912 A 19970319; US 96617689 A 19960319

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 6035412	A	25	G06F-011/00	CIP of application US 96617689 CIP of patent US 5852715

Abstract (Basic): US 6035412 A

NOVELTY - The backup of data stored in second set of volumes is performed to **tertiary storage** device after which the **mirroring** is resumed, and archived redo logs are transferred to **tertiary storage** device which **stores** it along with the backed up data. The two sets of volumes are re-synchronized with each other after resuming **mirroring**.

DETAILED DESCRIPTION - The contents of first set of volumes is **mirrored** into second set of volumes, while data is being written to first set of storage volumes. The **mirroring** is terminated after writing work, during which writing of data to first set of volumes is continued, thereby making the two sets of volumes in synchronous with each other. The archived redo logs for transaction that are applied to data stored in first set of storage volumes is generated.

USE - For database backup system by **mirroring** of primary database in computer system.

ADVANTAGE - Ensures high speed backups, since loads on the database host and storage subsystem is reduced by by-passing the paths to **tertiary storage**.

DESCRIPTION OF DRAWING(S) - The figure shows block diagram of database system with backup capability.

pp; 25 DwgNo 1A/9

Title Terms: DATA; COPY; GENERATE; METHOD; TERTIARY; STORAGE; DEVICE;  
RESUME; **MIRROR** ; AFTER; PERFORMANCE; DATA; STORAGE; ONE; SET; VOLUME;  
TERTIARY; STORAGE; DEVICE

Derwent Class: T01

International Patent Class (Main): **G06F-011/00**

File Segment: EPI

20/5/7 (Item 7 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
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011843958 \*\*Image available\*\*

WPI Acc No: 1998-260868/199823

Related WPI Acc No: 1993-152025; 1993-404302; 1994-248718; 1994-358517;

1999-243439; 1999-302242; 2000-270481; 2000-328326; 2001-326639;

2003-311594; 2003-327764; 2003-830438; 2004-355455

XPX Acc No: N98-205695

**Remote copy data storage system for stock market - includes host computer and storage system coupled to remote computer and storage system with indicators providing validity of data elements between systems**

Patent Assignee: EMC CORP (EMCE-N)

Inventor: ALTERESCU B; CASTEL D D C; OFEK Y Y O; SHKLARSKY G G; VISHLITZKY N; YANAI M

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 5742792	A	19980421	US 9352039	A	19930423	199823 B
			US 96654511	A	19960528	

Priority Applications (No Type Date): US 96654511 A 19960528; US 9352039 A 19930423

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5742792	A		55	G06F-012/16	CIP of application US 9352039 CIP of patent US 5544347

Abstract (Basic): US 5742792 A

The system includes a host computer with a data storage system including at least data storage system controller and at least one data storage device. The data storage system is coupled to the host computer for data storage. A second data storage system includes at least a second controller and at least one data storage device. The second data storage system is remotely coupled to the first for data copying. The first controller coordinates and controls the copying of the data.

The first data storage system maintains an index including at least a first indicator indicating whether a data element stored on the first data storage system is valid, a second indicator indicating validity of a data element stored on the second data storage system, a third indicator providing an indication of whether a write is pending to the data element stored on the first data system and at least a fourth indicator providing an indication of whether a write is pending to the data element stored in the second data storage system.

ADVANTAGE - Automatically and asynchronously generates mirror copy of storage at remote site.

Dwg.1/23

Title Terms: REMOTE; COPY; DATA; STORAGE; SYSTEM; STOCK; MARKET; HOST; COMPUTER; STORAGE; SYSTEM; COUPLE; REMOTE; COMPUTER; STORAGE; SYSTEM; INDICATE; VALID; DATA; ELEMENT; SYSTEM

Derwent Class: T01

International Patent Class (Main): G06F-012/16

File Segment: EPI

20/5/8 (Item 8 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
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011632837

WPI Acc No: 1998-049965/199805

XRFX Acc No: N98-039860

**Distributed intelligent controller systems - has intelligent storage RAID controllers on secondary bus, with bridge processor causing entire storage sub-system to appear as single logical entity to host system**

Patent Assignee: ANONYMOUS (ANON )

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
RD 402050	A	19971010	RD 97402050	A	19970920	199805 B

Priority Applications (No Type Date): RD 97402050 A 19970920

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
RD 402050	A		1 G06F-000/00	

Abstract (Basic): RD 402050 A

The challenge for intelligent peripherals is to provide a level of performance which is comparable or greater than when the peripheral is controlled by a system CPU. This may be a sizeable challenge since the system CPU may be orders of magnitude more powerful than an embedded processor dedicated to a peripheral.

An intelligent system employs intelligent sub-system network and storage controllers. This may also be implemented in a hierarchical fashion where the bridge processor might support I2O messaging and convert these messages to other I2O or proprietary messages for the controller devices. This could be used to provide an I2O interface for proprietary controllers without re-writing the controller software, and without incurring the additional overhead at the controller, providing higher performance. This architecture may also be used to implement a messaging layer at the bridge processor, allowing peer operation among secondary devices.

Since bus traffic is often not a limiting factor in system performance, the use of additional local intelligence may be implemented on a primary system bus.

**Three intelligent storage RAID controllers** can be located on the secondary bus. The bridge processor is used to cause the entire storage sub-system to appear as a single logical entity to the host system. Other storage management and redundancy functions, including cache **mirroring**, can be relegated to a local processor, either in bridge configuration.

USE - Architectures are applicable to other bus interface and processor architectures and also to other bridge architectures where local processors reside across interface such as P1394, SCSI or fibre-channel, rather than PCI bus.

ADVANTAGE - Use of intelligent controllers increases system performance compared to single bridge processor used to control non-intelligent peripheral controllers for network, storage or other functions. Local processor may be used to effect transfer of data from parity generation device, off-loading scatter/gather list processing from other controllers.

Dwg.0/1

Title Terms: DISTRIBUTE; INTELLIGENCE; CONTROL; SYSTEM; INTELLIGENCE; STORAGE; RAID; CONTROL; SECONDARY; BUS; BRIDGE; PROCESSOR; CAUSE; STORAGE ; SUB; SYSTEM; APPEAR; SINGLE; LOGIC; ENTITY; HOST; SYSTEM

Derwent Class: T01

International Patent Class (Main): G06F-000/00

File Segment: EPI

20/5/11 (Item 11 from file: 347)  
DIALOG(R)File 347:JAPIO  
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08314668 \*\*Image available\*\*  
REMOTE COPY SYSTEM USING TWO OR MORE SITES

PUB. NO.: 2005-062928 [JP 2005062928 A]  
PUBLISHED: March 10, 2005 (20050310)  
INVENTOR(s): IWAMURA TAKANARI  
OEDA TAKASHI  
SATO TAKAO  
APPLICANT(s): HITACHI LTD  
APPL. NO.: 2003-207004 [JP 2003207004]  
FILED: August 11, 2003 (20030811)  
INTL CLASS: G06F-003/06 ; G06F-012/00

#### ABSTRACT

PROBLEM TO BE SOLVED: To provide an information processing system capable of reducing the quantity of data to be lost when a first storage device and a second storage device fail simultaneously.

SOLUTION: Two storage areas are prepared in a first storage device, and data are remotely transferred and copied synchronously from the first storage area of the first storage device to the storage area of a second storage device, and the data are remotely transferred and copied asynchronously from the second area of the first storage device to the storage area of a third storage device. Also, the both storage areas of the first storage device are mirrored to a computer which performs access to the first storage device.

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20/5/12 (Item 12 from file: 347)  
DIALOG(R)File 347:JAPIO  
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Wrong  
date

07822231 \*\*Image available\*\*  
DISK ARRAY CONTROLLER

PUB. NO.: 2003-316525 [JP 2003316525 A]  
PUBLISHED: November 07, 2003 (20031107)  
INVENTOR(s): NAKAMURA JINICHI  
APPLICANT(s): SEIKO EPSON CORP  
APPL. NO.: 2002-126639 [JP 2002126639]  
FILED: April 26, 2002 (20020426)  
INTL CLASS: G06F-003/06

#### ABSTRACT

PROBLEM TO BE SOLVED: To provide a disk array configured of **three storage** units whose failure resistance and read/write performance is improved, and to provide a disk array having a switching circuit exclusive for backup capable of quickly executing backup or restore processing, and reducing a load on a system.

SOLUTION: The disk array controller 50 is provided with a disk array control circuit 51 configuring the disk array of **mirroring** for **three storage** units HDD 53, HDD 54, and HDD 55 and a switching circuit 52 for separating or re-connecting one arbitrary storage unit among those tree storage units from or to the disk array. Thus, it is possible to realize the direct connection to a backup device, and to realize the backup or restore processing in an ideal environment.

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20/5/13 (Item 13 from file: 347)  
DIALOG(R)File 347:JAPIO  
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07739616 \*\*Image available\*\*  
METHOD AND MEANS FOR BACKUP AND RECOVERY PROCESSING SYSTEM

PUB. NO.: 2003-233518 [JP 2003233518 A]  
PUBLISHED: August 22, 2003 (20030822)  
INVENTOR(s): YAMAKAMI KENJI  
APPLICANT(s): HITACHI LTD  
APPL. NO.: 2002-366022 [JP 2002366022]  
FILED: December 18, 2002 (20021218)  
PRIORITY: 01 033584 [US 200133584], US (United States of America),  
December 27, 2001 (20011227)  
INTL CLASS: G06F-012/00 ; G06F-003/06

#### ABSTRACT

PROBLEM TO BE SOLVED: To safely manage a **mirror** of a volume between remote sites for providing a means for backup and recovery.

SOLUTION: In this method for backup and recovery, a first storage subsystem connected to a first host and a second storage subsystem connected to a second host are used, and the first host and the second host are connected together via a path. A first logic volume is arranged in the first storage subsystem, while a second logic and a **third** logic volume are **stored** in the second storage subsystem. The second logic volume copies the first logic volume to be in a synchronous condition with the first logic volume. The third volume copies the second logic volume. A recovery means places the third logic volume on the second logic volume, reads a file to be recovered from the third volume in the second host, writes the file in the second volume, and the first volume is synchronized again with the second volume.

COPYRIGHT: (C)2003,JPO

*Patent*

Set	Items	Description
S1	1047146	STORE? ? OR STORAGE OR DRIVE? ? OR DISK? ? OR DISC? ?
S2	90512	(TEMPORARY OR SECONDARY OR BACKUP OR BACK?()UP OR STORE OR STORAGE)() (DEVICE? ? OR APPARATUS? ? OR SYSTEM? ? OR SUBSYSTEM? ? OR UNIT? ? OR DRIVE? ? OR DISK? ? OR DISC? ?)
S3	1045672	THREE OR THIRD OR 3RD OR TERTIARY
S4	11520	(SECONDARY OR SECOND OR 2ND OR ALTERNATIVE OR ANOTHER OR ADDITIONAL) (3N) S2
S5	6673	(PLURAL? OR MORE()THAN()ONE OR MANY OR SEVERAL OR MULTIPLE? ? OR MULTIPLICITY OR NUMEROUS) (3N) S2
S6	106783	MIRROR?
S7	4817	(DELETE? ? OR DELETING OR ERASE? ? OR ERASING OR REMOVE? ? OR REMOVING) (5N) (S6 OR COPY OR COPIES)
S8	13922	(SUCCESS? OR COMPLETE OR COMPLETED OR (ERROR? ? OR CORRUPT-?) (2N) (FREE OR NO OR "NOT")) (5N) (S6 OR COPY OR COPIES OR COPYING OR WRITE OR WRITING OR WRITTEN)
S9	0	(S4 OR S5) (30N) S6 (30N) S7 (30N) S8
S10	14	(S4 OR S5) (30N) S6 (30N) (S7 OR S8)
S11	14	IDPAT (sorted in duplicate/non-duplicate order)
S12	14	IDPAT (primary/non-duplicate records only)

File 348:EUROPEAN PATENTS 1978-2005/Oct W05  
(c) 2005 European Patent Office

File 349:PCT FULLTEXT 1979-2005/UB=20051110,UT=20051103  
(c) 2005 WIPO/Univentio

12/5/2 (Item 2 from file: 349)  
DIALOG(R)File 349:PCT FULLTEXT  
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Wrong date

01262826 \*\*Image available\*\*

**METHOD. SYSTEM. AND PROGRAM FOR ANDLING A FAILOVER TO A REMOTE STORAGE LOCATION**

**PROCEDE, SYSTEME ET PROGRAMME POUR GERER UNE REPRISE EN DIRECTION D'UN EMLACEMENT DE MEMOIRE ELOIGNE**

Patent Applicant/Assignee:

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IBM UNITED KINGDOM LIMITED, PO Box 41, North Harbour, Portsmouth, Hampshire PO6 3AU, GB, GB (Residence), GB (Nationality), (Designated only for: MG)

Patent Applicant/Inventor:

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PETERSEN David, 415 Chesapeake Drive, Great Falls, VA 22066, US, US (Residence), US (Nationality), (Designated only for: US)

LUDVIG Rune Willy, Fargargardstorget 24, 11643 Stockholm, SE, SE (Residence), US (Nationality), (Designated only for: US)

Legal Representative:

LING Christopher John (agent), IBM United Kingdom Limited, Intellectual Property Law, Hursley Park, Winchester, Hampshire S021 2JN, GB,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200571544 A1 20050804 (WO 0571544)

Application: WO 2004EP51117 20040615 (PCT/WO EP04051117)

Priority Application: US 2003465726 20030618

Designated States:

(All protection types applied unless otherwise stated - for applications 2004+)

AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM  
DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC  
LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO  
RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW  
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PL PT RO  
SE SI SK TR

(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

(AP) BW GH GM KE LS MW MZ NA SD SL SZ TZ UG ZM ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: G06F-011/20

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 8371

English Abstract

Provided are a method, program, and system for managing data. A mirror policy is processed indicating volumes in a first storage system to mirror to volumes in a second storage system and volumes in the second storage system to mirror to volumes in a third storage system, wherein the third storage system is at a first geographical location remote with respect to a second geo-graphical location including the first and second storage systems. A failure is detected of the first and second storage systems at the first geographical location. Automatic reconfiguration is made to network resources directing I/O requests to volumes in the first storage system to direct I/O requests to volumes in the third storage system. A failure of the first storage system and the availability of the second storage system is detected and, in response, network resources are re-configured to direct I/O requests to volumes in the first storage system to volumes in the second storage system in response to detecting

the failure of the first storage system and the availability of the second storage system. Updates to the second storage system are copied to the third storage system after reconfiguring network resources to direct I/O requests to volumes in the first storage system to volumes in the second storage system.

12/5,K/5 (Item 5 from file: 349)  
DIALOG(R)File 349:PCT FULLTEXT  
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Wrong date

01122163 \*\*Image available\*\*

**DATA STORAGE DEVICES HAVING IP CAPABLE PARTITIONS**

**DISPOSITIFS DE STOCKAGE DE DONNEES COMPRENANT DES PARTITIONS COMPATIBLES IP**

Patent Applicant/Assignee:

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Patent Applicant/Inventor:

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BABBITT William, Zetera Corporation, 22350 Gavilan Road, Perris, CA 92570, US, US (Residence), US (Nationality), (Designated only for: US)

Legal Representative:

RUTAN & TUCKER LLP (et al) (agent), Suite 1400, 611 Anton Blvd., Costa Mesa, CA 92626, US,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200444753 A1 20040527 (WO 0444753)

Application: WO 2002US40199 20021216 (PCT/WO US02040199)

Priority Application: US 2002425867 20021112

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ (utility model) CZ DE (utility model) DE DK (utility model) DK DM DZ EC EE (utility model) EE ES FI (utility model) FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SC SD SE SG SK (utility model) SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LU MC NL PT SE SI SK TR

(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: G06F-012/06

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 5696

**English Abstract**

A storage device (300) has partitions (310A, 310B, 310C, 320A, 320B, 320C, 330) that are separately addressed by distinct IP addresses (IP1, IP2, IP3, IP4, IP5, IP7, IP9). This allows direct access of the partitions (310A, 310B, 310C, 320A, 320B, 320C, 330), on a peer-to-peer basis, by any other device that can communicate using IP. Preferred storage devices support spanning between or among partitions of the same device, as well as between or among different storage devices. Both multicast and proxy spanning are contemplated. Combinations of the inventive storage devices with each other, and with prior art storage devices are contemplated, in all manner of mirroring and other arrangements. In still other aspects of the invention, a given storage device can comprise one or more types of media, including any combination of rotating and non-rotating media, magnetic and optical, and so forth.

**French Abstract**

L'invention concerne un dispositif de stockage (300) comprenant des partitions (310A, 310B, 310C, 320A, 320B, 320C, 330) adressees separement par des adresses IP distinctes (IP1, IP2, IP3, IP4, IP5, IP7, IP9). Cela permet un acces direct aux partitions (310A, 310B, 310C, 320A, 320B, 320C, 330), sur une base de pair a pair, par n'importe quel autre dispositif pouvant communiquer au moyen du protocole IP. Les dispositifs de stockage preferes prennent en charge un archivage multidisque entre ou parmi des partitions du meme dispositif, et entre ou parmi des dispositifs de stockage differents. L'invention se rapporte a l'archivage multidisque de type multicast et proxy. Elle porte en outre sur des combinaisons des dispositifs de stockage de l'invention les uns avec les autres et avec des dispositifs de stockage de la technique anterieure, selon n'importe quelle technique d'ecriture miroir et autres arrangements. Dans d'autres aspects de l'invention, un dispositif de stockage donne peut comprendre un ou plusieurs types de supports, y compris une combinaison quelconque de supports rotatifs et non rotatifs, magnetiques et optiques, etc.

Legal Status (Type, Date, Text)

Publication 20040527 A1 With international search report.

Publication 20040527 A1 With amended claims.

Examination 20040624 Request for preliminary examination prior to end of 19th month from priority date

Fulltext Availability:

Claims

Claim

... the storage device of claim 1, and a second storage device having additional partitions that **mirror** data stored in the first and **second** partitions.

20 A **storage system** comprising the storage device of claim 19, wherein the additional partitions of the **second storage device** are directly addressed by IP addresses that are distinct from the first and second IP...

...system comprising the storage device of claim 20, wherein the storage devices participating in a **mirrored** set discontinue processing requests **successfully completed** by another member of the **mirrored** set.

13 of 14

. A storage device having a first type of media logically split...

...second

I  
storage device having additional partitions that mirror data stored in the first and **second** partitions.

29 A **storage system** comprising the storage device of claim 28, wherein the additional partitions of the **second storage device** are directly addressed by IP addresses that are distinct from the first and second IP...

...system comprising the storage -device of claim 29, wherein the storage devices participating in a **mirrored** set discontinue processing requests **successfully completed** by another member of the **mirrored** set.

AMENDED SHEET (ARTICLE 19)

12/5,K/7 (Item 7 from file: 349)  
DIALOG(R)File 349:PCT FULLTEXT  
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01047092 \*\*Image available\*\*

**PRODUCING A MIRRORED COPY USING INCREMENTAL-DIVERGENCE  
PRODUCTION D'UNE COPIE MIROIR PAR DIVERGENCE INCREMENTALE**

Patent Applicant/Assignee:

MARATHON TECHNOLOGIES CORPORATION, 1300 Massachusetts Avenue, Boxborough,  
MA 01719, US, US (Residence), US (Nationality)

Inventor(s):

TREMBLAY Glenn A, 139 South Street, Upton, MA 01568, US,  
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KAMAN Charles H, 10, Oak Meadow Rd., Lincoln, MA 01773, US,  
GRANNUM Gairy, 35, Leonard Road, Boxborough, MA 01719, US,

Legal Representative:

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Priority Application: US 200290728 20020306

Designated States:

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JP

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SI SK TR

Main International Patent Class: G06F-011/00

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description  
Claims

Fulltext Word Count: 10378

English Abstract

Producing a mirror copy using incremental-divergence is performed in a  
computer system in which write requests (130) are each associated with a  
reference label. A mirror set may be restored to a state in which the  
data storage devices contain identical data by copying from the data  
storage device having "good" data only portions of data which have not  
been stored on the data storage device having divergent data.

Incremental-divergence copying may be accomplished by keeping track of  
the changes made after a point in which the data storage devices are  
known to contain identical data.

French Abstract

L'invention concerne la production d'une copie miroir par divergence  
incrementale dans un systeme informatique dans lequel des demandes (130)  
d'ecriture sont chacune associees a une etiquette de reference. Un  
ensemble miroir peut etre remis a l'etat dans lequel les dispositifs de  
stockage des donnees contiennent des donnees identiques en copiant dans  
le dispositif de stockage de donnees comprenant les bonnes donnees  
uniquement des parties de donnees n'ayant pas ete stockees dans le  
dispositif de stockage de donnees comprenant des donnees divergentes. La  
copie par divergence incrementale peut etre executee par suivi des  
changements faits apres un point sur lequel les dispositifs de stockage  
de donnees sont supposes contenir des donnees identiques.

Legal Status (Type, Date, Text)

Publication 20030918 A1 With international search report.

Fulltext Availability:

Claims



Claim

... of storage affected by new write requests  
in a fourth bit map;

26

after the **second** storage device confirms that data in the processed  
write requests have been written to non-volatile storage of the second  
**storage device**, sending a status message to the first storage device  
indicating whether the write data  
were...

...written, deleting the third bit map; and  
after receiving the status message indicating that the **write** data were  
not **successfully** written, **copying** the contents of the fourth bit map  
to the third bit map and deleting the fourth bit map.

37 A mirrored data storage system comprising:

a first **storage device**;

a **second storage device**;

a first controller associated with the first **storage device**; and

a **second** controller associated with the **second storage device**;

wherein:

the first controller is configured to:

receive write requests at a first **storage device**...

12/5,K/8 (Item 8 from file: 349)  
DIALOG(R)File 349:PCT FULLTEXT  
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00986557 \*\*Image available\*\*

**ASYNCHRONOUS MIRRORING IN A STORAGE AREA NETWORK**  
**MIROITAGE ASYNCHRONE DANS UNE ZONE DE STOCKAGE RESEAU**

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Application: WO 2002IL665 20020813 (PCT/WO IL02000665)

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AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ  
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR  
LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI  
SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LU MC NL PT SE SK TR

(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW

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Main International Patent Class: G06F-012/16

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Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 13256

**English Abstract**

A method and a system for simultaneously **mirroring** of one or many data objects from one or **many** local **storage devices** (SDL) to one or **many** remote **storage devices** (SDRx). The one or many data objects may be used during **mirroring**. A **mirroring** functionality consists in the application of a **succession** of freeze and **copy** procedures repeated sequentially in **successive mirroring** cycles. Only the last local updated version is saved in the remote storage device(s). Each new updated version overwrites the previous version. **Mirroring** is performed asynchronously in the background by freezing and copying successive discrete blocks of data. The mirroring functionality is operable to perform more than one mirroring operation simultaneously as well as simultaneously cross-mirroring.

**French Abstract**

L'invention concerne un procede et un systeme permettant un miroitage simultane d'un ou de plusieurs objets de donnees, a partir d'un ou de plusieurs dispositifs de stockage locaux, sur un ou plusieurs dispositifs de stockage eloignes. L'objet de donnees peut etre utilise pendant le miroitage. Une fonctionnalite de miroitage comprend l'application d'une succession de procedures de figeage et de copie, repetees de maniere sequentielle dans des cycles de miroitage successifs. Seule la derniere version locale miroitee mise a jour est enregistree dans le dispositif de stockage eloigne. Chaque nouvelle version mise a jour ecrase la version precedente. Le miroitage s'effectue de maniere asynchrone, en arriere

plan, par figeage et copie de blocs de donnees discrets successifs. La fonctionnalite de miroitage peut servir a effectuer plus d'une operation de miroitage simultanement, ainsi qu'un miroitage croise.

Legal Status (Type, Date, Text)

Publication 20030227 A2 Without international search report and to be republished upon receipt of that report.  
Examination 20030912 Request for preliminary examination prior to end of 19th month from priority date  
Search Rpt 20040318 Late publication of international search report  
Republication 20040318 A3 With international search report.

Fulltext Availability:  
Detailed Description  
Claims

English Abstract

A method and a system for simultaneously **mirroring** of one or many data objects from one or **many** local **storage devices** (SDL) to one or **many** remote **storage devices** (SDRx). The one or many data objects may be used during **mirroring**. A **mirroring** functionality consists in the application of a **succession** of freeze and **copy** procedures repeated sequentially in **successive mirroring** cycles. Only the last local updated version is saved in the remote storage device(s). Each new updated version overwrites the previous version. **Mirroring** is performed asynchronously in the background by freezing and copying successive discrete blocks of data...

Detailed Description

... updates addressed to the selected data object, permitting use of the selected data object during **mirroring** in associative operation with the ultimate resulting source volume, synchronizing the penultimate local auxiliary volume...  
...at least one ultimate remote volume into the penultimate remote volume, and repeating a next **mirroring** cycle by default command after completion of copy to the at least one **second storage device**, unless receiving command for **mirroring** break.

It is yet a further object of the present invention to provide a method and a system for.

storing in the at least one remote storage device of a **complete mirrored copy** of the selected data object comprising updates entered thereto at the time when copy of...for copying from and one remote storage device for writing thereto.  
As stated above, the **mirroring** of a data object from one **storage device** to **another storage device** requires the application of **successive** freeze and **copy** procedures.

However, the operation of a network connectivity may not be hampered while **mirroring**.

Therefore, the description below illustrates first the freeze procedure, then the operation 1 5 of...objects to be frozen, whether belonging to the same selected data object or stored in **more than one** local **storage device**. The cycle time to the next **mirroring** cycle is 2 0 dictated by the time needed for the **copy** procedure to **complete** the last **copy**, when multiple **copies** are performed, such as to **many** remote **storage devices**.

It is also noted that simultaneous cross **mirroring**, from local to remote storage device and vice-versa is also practical with the **mirroring** functionality for the rows I to VI inclusive. As a simple example for the method of row 1, both the local host HL and the remote host HR operate the **mirroring** functionality, each host acting as the local host while the other host is the remote...

Claim

... updates addressed to the selected data object, permitting use of the selected data object during **mirroring** in associative operation with the ultimate resulting source volume, 4 0 synchronizing the penultimate local the penultimate remote volume, and repeating a next **mirroring** cycle by default command after completion of copy to the at least one **second storage device**, unless receiving command for **mirroring** break.

15 The method according to Claim 14, wherein **mirroring** further comprises the steps of storing in the at least one remote storage device of a **complete mirrored copy** of the selected data object comprising updates entered thereto at the time when copy of...in the ultimate resulting source volume, the selected data object being permitted for use during **mirroring** in associative operation with the ultimate resulting source volume and, the penultimate local auxiliary volume...  
...least one ultimate remote volume being synchronized into the penultimate remote volume, and a next **mirroring** cycle being repeated by default command after completion of copy to the at least one **second storage device** (SDR), unless a command for **mirroring** break is received.

39 The system according to Claim 3 8, wherein **mirroring** further comprises: the at least one remote storage device storing a **complete mirrored copy** of the selected data object comprising updates entered thereto at the time when copy of...

12/5,K/13 (Item 13 from file: 349)  
DIALOG(R)File 349:PCT FULLTEXT  
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00738012 \*\*Image available\*\*

**METHOD AND SYSTEM FOR MIRRORING AND ARCHIVING MASS STORAGE**  
**PROCEDE ET SYSTEME DE DOUBLEMENT ET D'ARCHIVAGE D'UNE MEMOIRE DE GRANDE**  
**CAPACITE**

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Application: WO 2000US3787 20000214 (PCT/WO US0003787)

Priority Application: US 99255486 19990223

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AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD  
GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD  
MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG  
UZ VN YU ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

(AP) GH GM KE LS MW SD SL SZ TZ UG ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

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Publication Language: English

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Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 14752

**English Abstract**

A method and system for mirroring and archiving mass storage. A primary mass storage (20) and a secondary mass storage (50) are synchronized to contain the same data. Thereafter a primary system (12) tracks changes (60a-60c) made to the primary mass storage. These changes are consolidated periodically into update files, the consolidations representing changes made to the primary mass storage during a time interval that ends when the primary mass storage is in a logically consistent state. These update files contain only those changes necessary to represent the modified state of the primary mass storage at the time of the update. The primary system then transfers the update files to a secondary system to bring the secondary mass storage current with the primary mass storage. The consolidation minimizes the amount of information that must be transferred and therefore allows for a relatively low bandwidth communication channel. In addition, update files may be cached (70, 72, 74) by the primary system so that requests for mirrored or archived data may be fulfilled by the primary system cache rather than requiring access to the secondary system.

**French Abstract**

L'invention concerne un procede et un systeme de doublement et d'archivage d'une memoire de grande capacite. Une premiere memoire de grande capacite (20) et une seconde memoire de grande capacite (50) sont synchronisees de maniere a contenir les memes donnees. Un premier systeme (12) permet ensuite de faire le suivi de toute modification (60a-60c)

apportee a la premiere memoire de grande capacite, ces modifications etant groupees periodiquement en fichiers de mise a jour de sorte que ces groupages representent les modifications apportees a la premiere memoire de grande capacite pendant un laps de temps qui s'acheve lorsque cette premiere memoire de grande capacite se trouve dans un etat logiquement coherent. Ces fichiers de mise a jour ne contiennent que les modifications necessaires pour représenter l'etat modifie de la premiere memoire de grande capacite au moment de la mise a jour. Le premier systeme transfere ensuite lesdits fichiers de mise a jour a un second systeme, afin d'actualiser la seconde memoire de grande capacite en fonction de la premiere memoire de grande capacite. En outre, le groupage minimise la quantite d'informations devant etre transferees, et permet donc l'utilisation d'un canal de communication a largeur de bande relativement limitee. Enfin, les fichiers de mise a jour peuvent etre mis en antememoire (70, 72, 74) par le premier systeme, de sorte que l'antememoire de ce premier systeme peut satisfaire les demandes de donnees doublees ou archivees sans qu'il soit necessaire d'accéder au second systeme.

Legal Status (Type, Date, Text)

Publication 20000831 A1 With international search report.

Publication 20000831 A1 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Examination 20001109 Request for preliminary examination prior to end of 19th month from priority date

Fulltext Availability:

Detailed Description

Detailed Description

... consolidated changes. Second, the system and method of the present invention emphasize security of the **mirroring** and archiving by ensuring that the primary storage system is in a logically consistent state...

...that a primary mass storage system connected to a primary system and a secondary mass **storage system** connected to a **secondary system** contain identical data. This may be accomplished, for example, by making a complete **copy** of the primary mass **storage system** to the **secondary mass storage system** using either traditional backup techniques or traditional disk mirroring techniques. Once the primary mass **storage system** and the **secondary mass storage system** contain the same data, the present invention tracks the changes made to the primary mass...